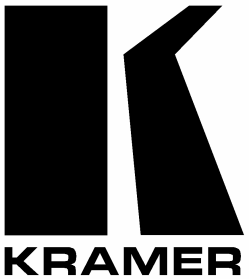
Kramer Electronics, Ltd.



USER MANUAL

Models:

VP-413, ***Video to WXGA Scaler***

VP-414, ***Video to WXGA / HD Scaler***

VP-415, ***Video to WXGA / DVI Scaler***

VP-416, ***Video to DVI-I / HD Scaler***

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 500-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer TOOLS **VP-413** *Video to WXGA Scaler* and/or **VP-414** *Video to WXGA / HD Scaler* and/or **VP-415** *Video to WXGA / DVI-I Scaler* and/or **VP-416** *Video to WXGA / HD / DVI-I Scaler*, which are ideal for the following typical applications:

- Multimedia and presentation applications for projecting a Composite Video or s-Video source using a data projector, plasma, or TFT flat-screen
- Presentation and conference room systems, board rooms and auditoriums
- Rental and Staging

The package includes the following items:

- **VP-413** *Video to WXGA Scaler,* and/or **VP-414** *Video to WXGA / HD Scaler,* and/or **VP-415** *Video to WXGA / DVI-I Scaler,* and/or **VP-416** *Video to WXGA / HD / DVI-I Scaler*
- Power adapter: 5V DC Input for **VP-413** and **VP-415**; 12V DC Input for **VP-414** and **VP-416**
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[3]

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

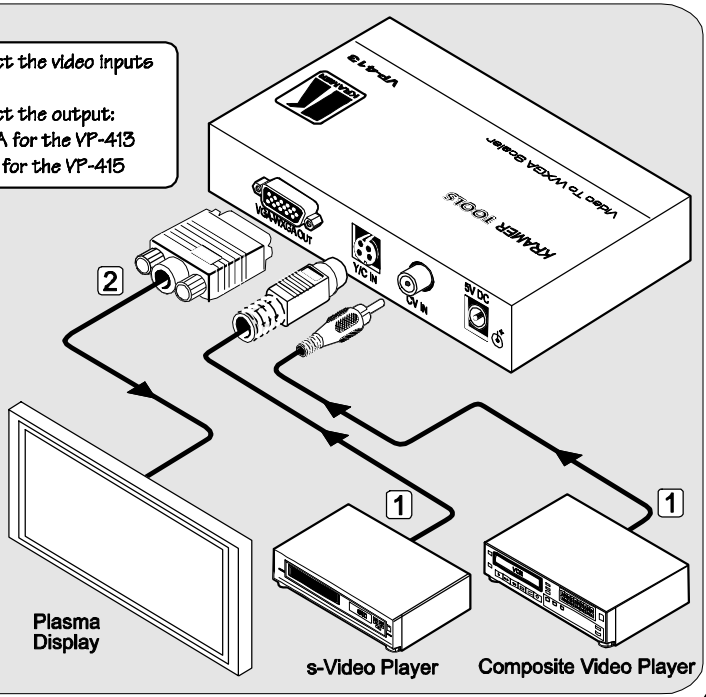
2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

Step 1: Connect the Machine

Quick Start: VP-413 VP-415

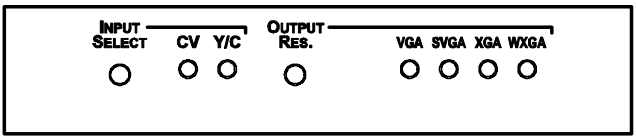
1. Connect the video inputs
2. Connect the output:
   - VGA for the VP-413
   - DVI for the VP-415



Step 2: Connect the power

Machine settings:

- Set the desired input by pressing the INPUT SELECT button
- Set the desired resolution by pressing the OUTPUT RES. button



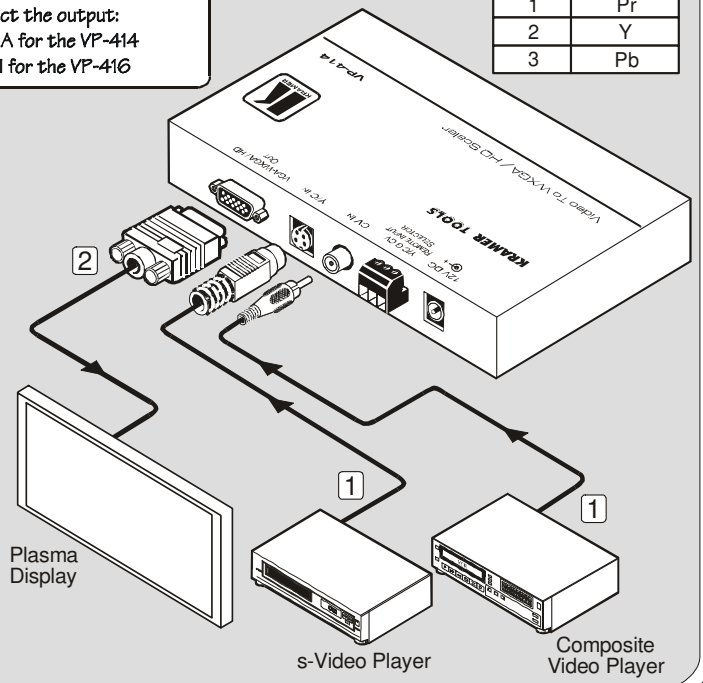
Step 1: Connect the Machine

Quick Start: VP-414 VP-416

1. Connect the video inputs
2. Connect the output:
   - VGA for the VP-414
   - DVI for the VP-416

OUTPUT Connector PINOUT for the VP-414

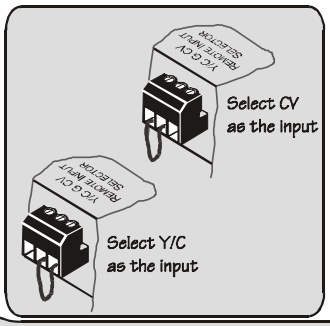
PIN #	Signal
1	Pr
2	Y
3	Pb



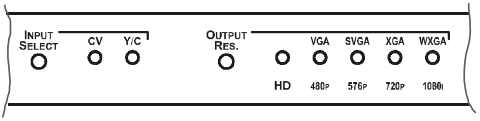
Step 2: Connect the power

Machine settings:

CONTACT CLOSURE REMOTE CONTROL PINS



- Press the INPUT SELECT button to set the desired input
- Press the OUTPUT RES. button to set the desired resolution



3 Overview

The Kramer **VP-413/VP-414/VP-415/VP-416** is a high quality low cost converter for up-scaling composite video and s-Video that accepts PAL-B/D/G/H/I, NTSC 3.58, and NTSC 4.43 video formats. This compact, multi-standard unit has a built-in 3D de-interlacer and a 3D comb-filter that ensures superb quality.

The **VP-413/VP-414/VP-415/VP-416** features:

- An external DC source[1], making it suitable for field operation
- Side-panel buttons for selecting the input source and the output resolution – indicated by LEDs
- Non-volatile memory that retains the last setting, after switching the power off
- A remote input selector (for **VP-414** and **VP-416**)

Table 1 describes the unique characteristics of each scaler:

Table 1: VP-413, VP-414, VP-415 and VP-416 Scalers

Model	Inputs	Output	Output Connector	Output Resolution	Output Format
VP-413	CV or Y/C	VGA	HD15 Connector	VGA-WXGA[2]	RGBHV
VP-414		VGA / HD		VGA-WXGA[2] / HD[3]	RGBHV / YPbPr[4]
VP-415		VGA/DVI	DVI-I Connector	VGA-WXGA[2]	RGBHV
VP-416		VGA / DVI / HD		VGA-WXGA[2] / HD[3]	RGBHV / YPbPr[4]

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise-levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your Kramer **VP-413/VP-414/VP-415/VP-416** away from moisture, excessive sunlight and dust

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[5].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

1 5V DC for the VP-413 and the VP-415; 12V DC for the VP-414 and the VP-416

2 Includes: VGA, SVGA, XGA and WXGA

3 Includes: 480p, 576p, 720p and 1080i (a pseudo 1080i format is used in this case, such as a progressive scan 540p. Note that in the case that the DVI output is connected to an HDMI monitor, make sure that the monitor can accept 540p)

4 Component color space

5 For example: model number AD2512C, part number 2535-000251

4 Your Scaler

This section describes the **VP-413** (see section 4.1), the **VP-414** (see section 4.2), the **VP-415** (see section 4.3) and the **VP-416** (see section 4.4).

4.1 Your VP-413 Video to WXGA Scaler

The **VP-413** cover is perforated to prevent chip overheating. Figure 1 and Table 2 define the **VP-413** *Video to WXGA Scaler:*

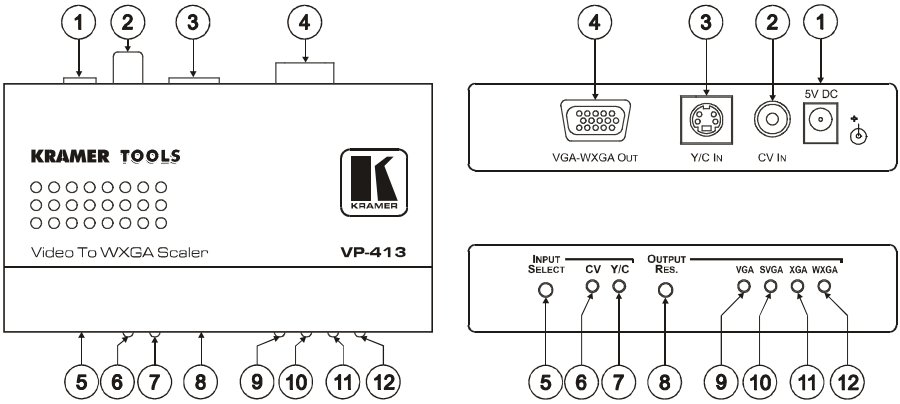


Figure 1: VP-413 Video to WXGA Scaler

Table 2: VP-413 Video to WXGA Scaler Features

#	Feature	Function
1	*5V DC*	+5V DC connector for powering the unit
2	*CV IN* RCA Input Connector	Connects to a composite video source
3	*Y/C IN* 4p Input Connector	Connects to an s-Video source
4	*VGA-WXGA OUT* HD15F Output Connector	Connects to the VGA-WXGA acceptor
5	*INPUT SELECT* Button	Press to select between inputs
6	*CV* LED	Illuminates when CV input is selected
7	*Y/C* LED	Illuminates when Y/C input is selected
8	*OUTPUT RES.* Button	Press to select desired output resolution
9	*VGA* LED	Illuminates when VGA resolution is selected
10	*SVGA* LED	Illuminates when SVGA resolution is selected
11	*XGA* LED	Illuminates when XGA resolution is selected
12	*WXGA* LED	Illuminates when WXGA resolution is selected

4.2 Your VP-414 Video to WXGA / HD Scaler

Figure 2 and Table 3 define the **VP-414** *Video to WXGA / HD Scaler*:

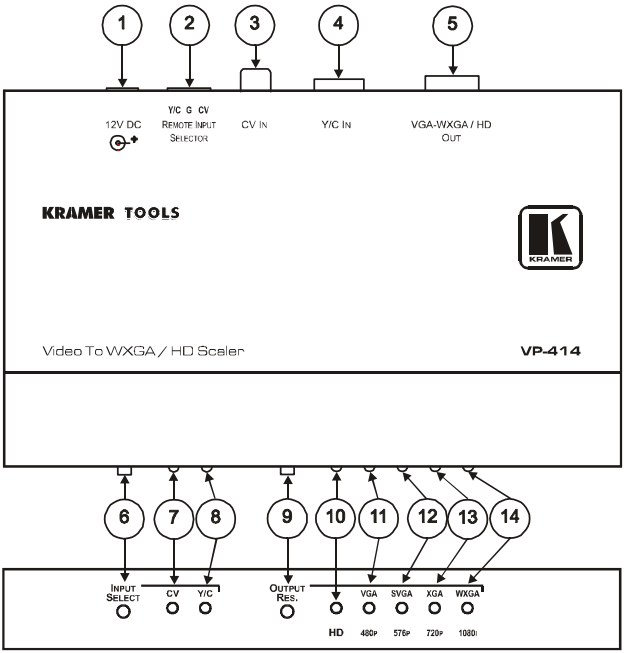


Figure 2: VP-414 Video to WXGA / HD Scaler

Table 3: VP-414 Video to WXGA / HD Scaler Features

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*REMOTE INPUT SELECTOR* Terminal Block Connector	Connects to a dry contact switch for remote selection between Y/C and CV (see section 5.5)
3	*CV IN* RCA Input Connector	Connects to a composite video source
4	*Y/C IN* 4p Input Connector	Connects to an s-Video source
5	*VGA-WXGA / HD OUT* HD15F Output Connector	Connects to the VGA-WXGA / HD acceptor
6	*INPUT SELECT* Button	Press to select between inputs
7	*CV* LED	Illuminates when CV input is selected
8	*Y/C* LED	Illuminates when Y/C input is selected
9	*OUTPUT RES.* Button	Press to select desired output resolution
10	*HD* LED	Illuminates when HD[1] output resolutions are selected
11	*VGA / 480p* LED	Illuminates when VGA or 480p resolution is selected
12	*SVGA / 576p* LED	Illuminates when SVGA or 576p resolution is selected
13	*XGA / 720p* LED	Illuminates when XGA or 720p resolution is selected
14	*WXGA / 1080i* LED	Illuminates when WXGA or 1080i resolution is selected[2]

1 480p, 576p, 720p or 1080i

2 A pseudo 1080i format is used in this case, such as a progressive scan 540p. Note that in the case that the DVI output is connected to an HDMI monitor, make sure that the monitor can accept 540p

4.3 Your VP-415 Video to WXGA / DVI Scaler

Figure 3 and Table 4 define the **VP-415** *Video to WXGA / DVI Scaler:*

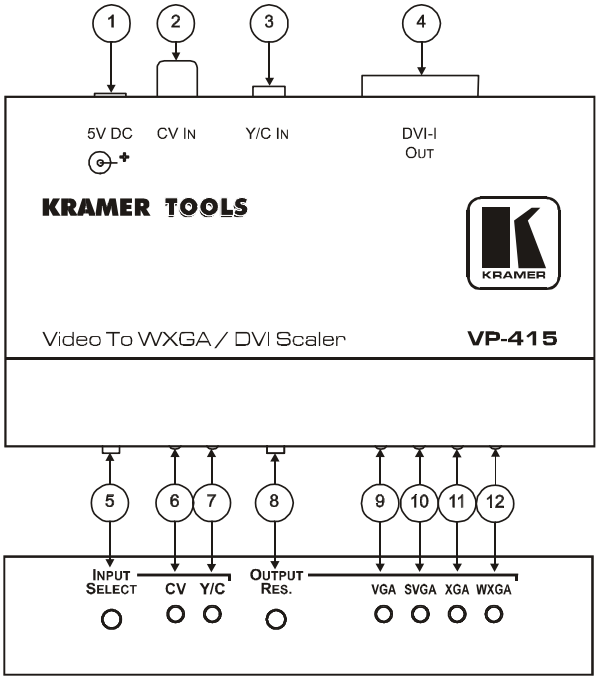


Figure 3: VP-415 Video to WXGA Scaler

Table 4: VP-415 Video to WXGA Scaler Features

#	Feature	Function
1	*5V DC*	+5V DC connector for powering the unit
2	*CV IN* RCA Input Connector	Connects to a composite video source
3	*Y/C IN* 4p Input Connector	Connects to an s-Video source
4	*DVI-I OUT* DVI Connector	Connects to the DVI graphics acceptor (analog, digital or both)
5	*INPUT SELECT* Button	Press to select between inputs
6	*CV* LED	Illuminates when CV input is selected
7	*Y/C* LED	Illuminates when Y/C input is selected
8	*OUTPUT RES.* Button	Press to select desired output resolution
9	*VGA* LED	Illuminates when VGA resolution is selected
10	*SVGA* LED	Illuminates when SVGA resolution is selected
11	*XGA* LED	Illuminates when XGA resolution is selected
12	*WXGA* LED	Illuminates when WXGA resolution is selected

4.4 Your VP-416 Video to DVI-I / HD Scaler

Figure 4 and Table 5 define the **VP-416** *Video to DVI-I / HD Scaler*:

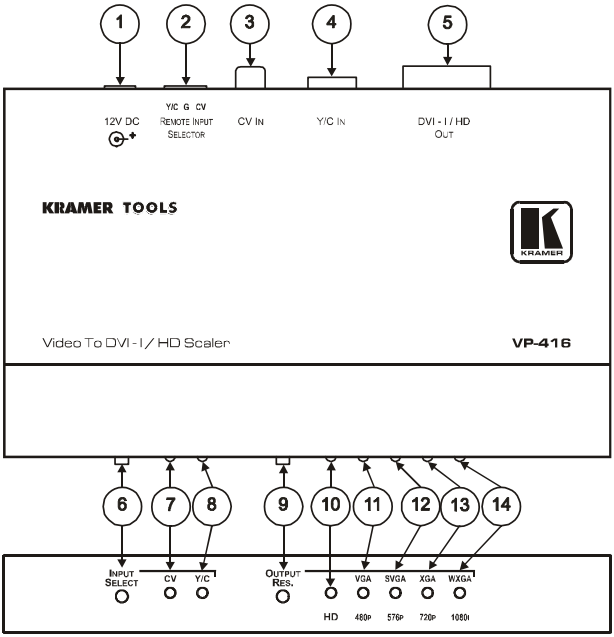


Figure 4: VP-416 Video to DVI-I / HD Scaler

Table 5: VP-416 Video to WXGA / DVI-I / HD Scaler Features

#	Feature	Function
1	*12V DC*	+12V DC connector for powering the unit
2	*REMOTE INPUT SELECTOR* Terminal Block Connector	Connects to a dry contact switch for remote selection between Y/C and CV (see section 5.5)
3	*CV IN* RCA Input Connector	Connects to a composite video source
4	*Y/C IN* 4p Input Connector	Connects to an s-Video source
5	*DVI-I / HD OUT* DVI Output Connector	Connects to the VGA-WXGA / HD acceptor (analog, digital or both)
6	*INPUT SELECT* Button	Press to select between inputs
7	*CV* LED	Illuminates when CV input is selected
8	*Y/C* LED	Illuminates when Y/C input is selected
9	*OUTPUT RES.* Button	Press to select desired output resolution
10	*HD* LED	Illuminates when HD[1] output resolutions are selected
11	*VGA / 480p* LED	Illuminates when VGA or 480p resolution is selected
12	*SVGA / 576p* LED	Illuminates when SVGA or 576p resolution is selected
13	*XGA / 720p* LED	Illuminates when XGA or 720p resolution is selected
14	*WXGA / 1080i* LED	Illuminates when WXGA or 1080i resolution is selected[2]

1 480p, 576p, 720p or 1080i

2 A pseudo 1080i format is used in this case, such as a progressive scan 540p. Note that in the case that the DVI output is connected to an HDMI monitor, make sure that the monitor can accept 540p

5 Connecting the Scalers

The following sections describe how to connect each of the four units.

5.1 Connecting the VP-413

To connect the **VP-413**, as the example in Figure 5 illustrates, do the following[1]:

1. Connect a composite video source to the CV IN RCA connector and/or an s-Video source to the Y/C 4p input connector.
2. Connect the VGA – WXGA OUT HD15F connector to an acceptor (for example, a plasma display).
3. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 5).
4. Press the INPUT SELECT button to select the desired input.
5. Press the OUTPUT RES. button to select the desired resolution.

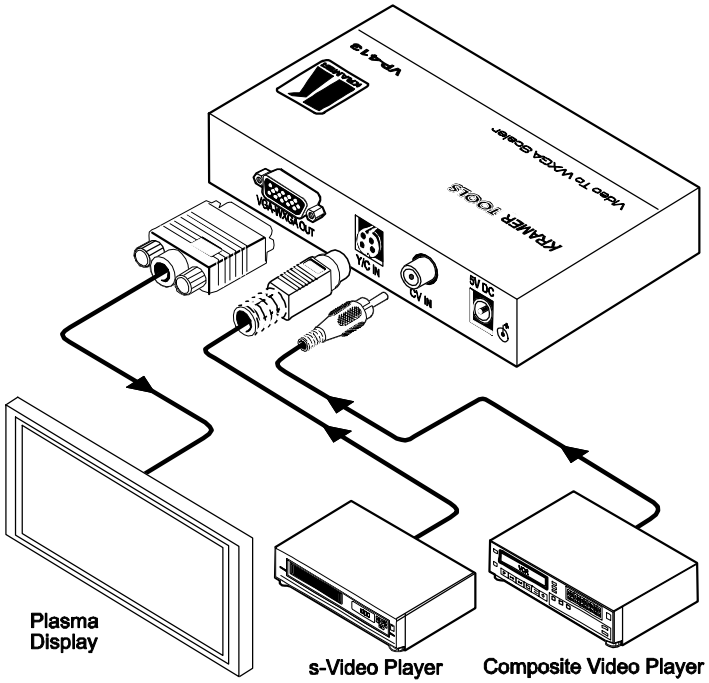


Figure 5: Connecting the VP-413

1 Switch OFF the power on each device before connecting it to your VP-413. After connecting your VP-413, switch on its power and then switch on the power on each device

5.2 Connecting the VP-414

To connect the **VP-414**, as the example in Figure 6 illustrates, do the following[1]:

1. Connect a composite video source to the CV IN RCA connector and/or an s-Video source to the Y/C 4p input connector.
2. Connect the VGA – WXGA / HD OUT HD15F connector to an acceptor (for example, a plasma display).
3. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 6).
4. Press the INPUT SELECT button to select the desired input[2].
5. Press the OUTPUT RES. button to select the desired resolution[3].
6. If required, connect[4] the contact closure remote control PINS (see section 5.5).

OUTPUT Connector PINOUT

PIN #	Signal
1	Pr
2	Y
3	Pb

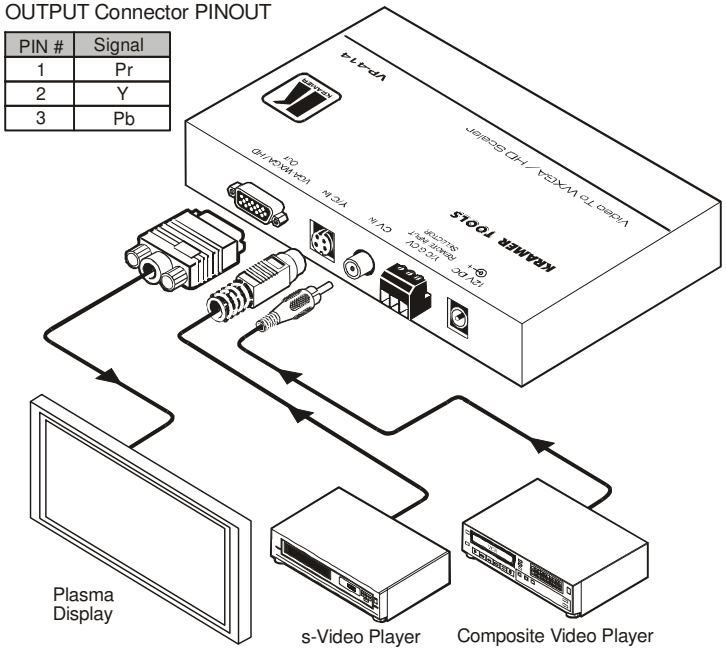


Figure 6: Connecting the VP-414

1 Switch OFF the power on each device before connecting it to your VP-414. After connecting your VP-414, switch on its power and then switch on the power on each device

2 The VP-414 includes an HD LED, which illuminates when HD resolutions are selected (item 10 in Table 3)

3 Note that the HD resolutions are in YUV colorspace

4 The connection is not illustrated in Figure 6

5.3 Connecting the VP-415

To connect the **VP-415**, as the example in Figure 7 illustrates, do the following[1]:

1. Connect a composite video source to the CV IN RCA connector and/or an s-Video source to the Y/C 4p input connector.
2. Connect the DVI-I OUT connector to an acceptor (for example, a plasma display).
   Both analog and digital signals are available on this output.
3. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 7).
4. Press the INPUT SELECT button to select the desired input.
5. Press the OUTPUT RES. button to select the desired resolution.

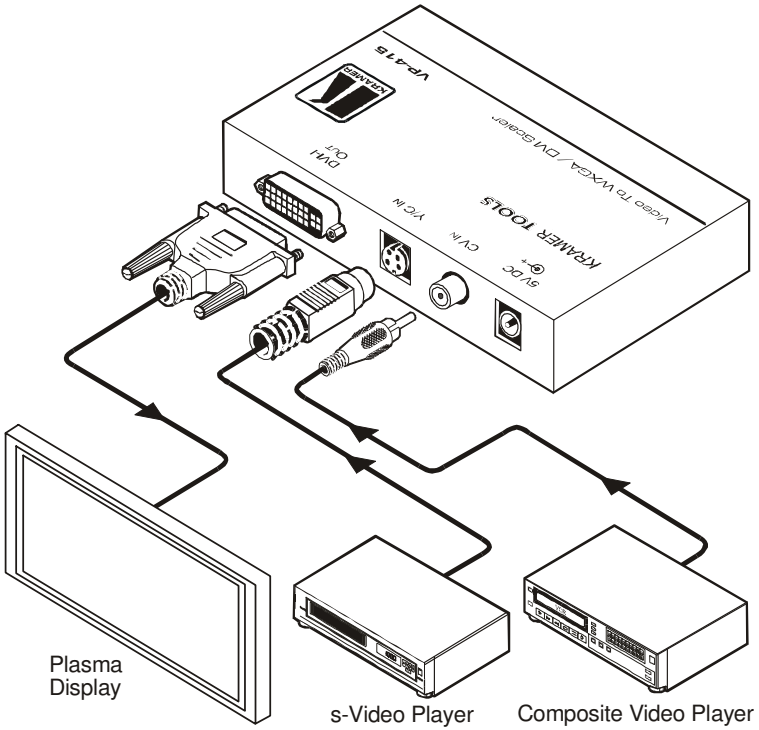


Figure 7: Connecting the VP-415

1 Switch OFF the power on each device before connecting it to your VP-415. After connecting your VP-415, switch on its power and then switch on the power on each device

5.4 Connecting the VP-416

To connect the **VP-416**, as the example in Figure 8 illustrates, do the following[1]:

1. Connect a composite video source to the CV IN RCA connector and/or an s-Video source to the Y/C 4p input connector.
2. Connect the DVI-I / HD connector to an acceptor (for example, a Plasma Display).
   Both analog and digital signals are available on this output.
3. Connect the 12V DC power adapter to the power socket and connect the adapter to the mains electricity (not shown in Figure 8).
4. Press the INPUT SELECT button to select the desired input[2].
5. Press the OUTPUT RES. button to select the desired resolution[3].
6. If required, connect[4] the contact closure remote control PINS (see section 5.5).

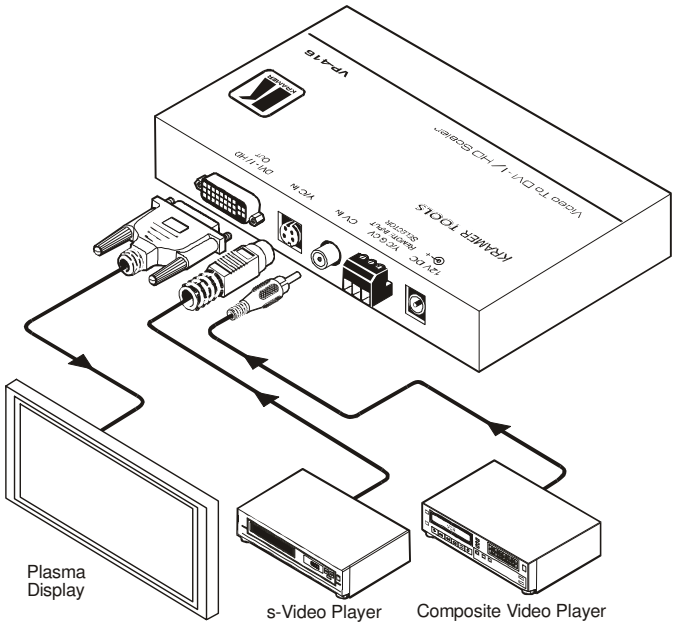


Figure 8: Connecting the VP-416

1 Switch OFF the power on each device before connecting it to your VP-416. After connecting your VP-416, switch on its power and then switch on the power on each device

2 The VP-416 includes an HD LED, which illuminates when HD resolutions are selected (item 10 in Table 5)

3 Note that the HD resolutions are in YUV colorspace

4 The connection is not illustrated in Figure 6

5.5 Connecting the Contact Closure Remote Control PINs

The REMOTE INPUT SELECTOR lets you select the required input via the contact closure remote control pins.

For example, you may override the presently routed input by using the remote control contact closure. To do so, connect momentarily the appropriate input[1] pin on the REMOTE terminal block connector to the G (Ground) pin, as Figure 9 illustrates.

DO NOT Connect more than one PIN to the Ground PIN at the same time

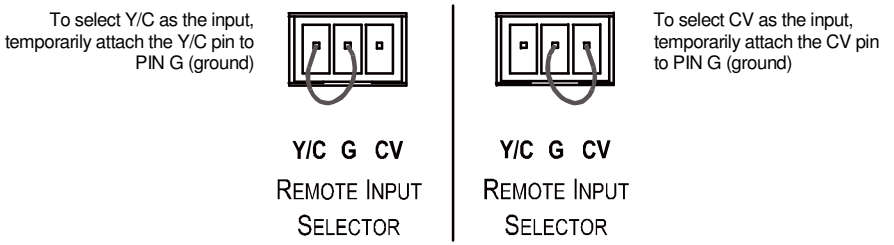

To select Y/C as the input, temporarily attach the Y/C pin to PIN G (ground)
Y/C G CV
REMOTE INPUT SELECTOR
Y/C G CV
REMOTE INPUT SELECTOR
To select CV as the input, temporarily attach the CV pin to PIN G (ground)

Figure 9: Connecting the Contact Closure Remote Control PINS

1 Y/C or CV

6 Technical Specifications

Table 6 includes the technical specifications[1]:

Table 6: Technical Specifications of the VP-413, VP-414, VP-415 and VP-416

INPUTS:	1 CV 1Vpp/75Ω on an RCA connector; 1 Y/C 1Vpp (Y); 0.3Vpp (C)/75Ω on a 4p connector
OUTPUTS:	**VP-413**: 1 VGA (VGA through WXGA) on an HD15F connector **VP-414**: 1 VGA (VGA through WXGA /HD) on an HD15F connector **VP-415**: 1 VGA (analog) and 1 DVI-D (digital) on a DVI-I connector (VGA through WXGA) **VP-416**: 1 VGA (analog) and 1 DVI-D (digital) on a DVI-I connector (VGA through WXGA and HD)
OUTPUT RESOLUTIONS:	**VP-413**, **VP-415**: VGA (640 x 480), SVGA (800 x 600), XGA (1024 x 768) and WXGA (1366 x 768) **VP-414**, **VP-416**: VGA (640 x 480), SVGA (800 x 600), XGA (1024 x 768) and WXGA (1366 x 768), 480p, 576p, 720p and 1080i[2] (for HD resolutions, the output Y signal has a bi-level SYNC)
OUTPUT REFRESH RATE:	60Hz
CONTROLS:	Pushbuttons and LEDs for selection of Input Source and Output Resolution **VP-414**, **VP-416**: also, YC/CV dry contact input selector (external wires)
POWER SOURCE:	**VP-413**: 5V DC, 800mA (typical) **VP-414**: 12V DC, 500mA (typical) **VP-415**: 5V DC, 850mA (typical) **VP-416**: 12V DC, 500mA (typical)
DIMENSIONS:	**VP-413**, **VP-415**: 12cm x 7.5cm x 2.5cm (4.7" x 2.95" x 0.98", W, D, H) **VP-414**, **VP-416**: 18.8cm x 11.4cm x 2.4cm (7.41" x 4. 5" x 0.95", W, D, H)
WEIGHT:	**VP-413**, **VP-415**: 0.3 kg. (0.67 lbs.) approx. **VP-414**, **VP-416**: 0.4 kg. (0.88 lbs.) approx.
ACCESSORIES:	Power supply: 5V for **VP-413** and **VP-415**; 12V for **VP-414** and **VP-416**
OPTIONS:	**VA-50P** Power supply (can be used to power up to 3 **VP-414** / **VP-416** units) **VA-100P** Power supply (can be used to power up to 5 **VP-414** / **VP-416** units)

1 Specifications are subject to change without notice

2 A pseudo 1080i format is used in this case, such as a progressive scan 540p. Note that in the case that the DVI output is connected to an HDMI monitor, make sure that the monitor accepts 540p

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000042 REV 6